tained at a pH of about 10 or above. The pH may be held at this level until the proteinaceous impurities in the colloid are oxidized, e.g., several hours after the addition of the selected oxidizing agent, after which the pH is then adjusted to slightly acid, e.g., about 5 to about 5.7, before precipitation of the Xanthomonas hydrophilic colloid through the addition of an alcohol.

To further illustrate my invention there are presented the following examples in which all parts and percentages are by weight unless otherwise indicated.

## EXAMPLE I

To 500 grams of a fermentation beer containing a *Xanthomonas campestris* hydrophilic colloid, prepared in the general manner as described above, was added 100 milliliters of a liqlid bleach containing 6% by weight of sodium hypochlorite in water. After the addition of the liquid bleach, the pH of the mixture was adjusted to 11.5 through the addition of sodium hydroxide. The reaction mixture was then stirred for 2½ hours and neutralized to a pH of 5.7 through the addition of hydrochloric acid. After neutralization, the *Xanthomonas campestris* hydrophilic colloid was precipitated through the addition of 750 milliliters of isopropanol. The *Xanthomonas campestris* hydrophilic colloid had good clarity and a pH of 7.05. The pH of the product and its viscosity in aqueous solution corresponded to the pH and viscosity of an authentic sample of *Xanthomonas campestris* hydrophilic colloid thereby showing that my process did not degrade the *Xanthomonas campestris* hydrophilic colloid.

## EXAMPLE II

To 500 grams of a 2% aqueous solution of the *Xanthomonas campestris* hydrophilic colloid in water (including proteinaceous impurities in the Xanthomonas hydrophilic colloid) was added 50 milliliters of liquid bleach containing sodium hypochlorite to produce a sodium hypochlorite concentration in the overall mixture of about 0.55 percent by weight. The pH of the overall mixture was then adjusted to 10 through the addition of sodium hydroxide and was held at this level for 1 hour which the pH was then adjusted to 5.5 through the addition of hydrochloric acid. The *Xanthomonas campestris* hydrophilic colloid was then precipitated through the addition of 750 milliliters of isopropanol. The resultant product was found to have very good clarity which was far superior to that of the 2% solution of Xanthomonas colloid employed as the starting material.

## EXAMPLE III

To 1,000 grams of a fermentation beer containing a *Xanthomonas campestris* hydrophilic colloid and prepared in the manner generally described above, was added 8.0 grams of sodium hydroxide. After the addition of the sodium hydroxide, the mixture was stirred for 15 minutes and chlorine gas was then slowly added through means of a bubble tube until the pH of the overall mixtlre had dropped to 9.5. Additional sodium hydroxide was then added (1 gram) in order to raise the pH of the mixture to 11.1. The reaction mixture was then held for 4 hours after which the pH was adjusted to 5.3 through the addition of hydrochloric acid. The colloid was then precipitated with isopropanol, as in the previous examples, and the yield of the resulting high purity *Xanthomonas campestris* hydrophilic colloid was 23.5 grams. The material had very good clarity and its viscosity in an aqueous solution at a concentration of 1% by weight was 960 cps. at a pH of 6.6. An aqueous solution of the colloid had very slight haze and was easily polish filtered in order to remove the last traces of haze.

Polish filtration was accomplished by usual methods such as the use of diatomaceous earth. Preferably, the polish filtration of the product was performed at a temperature of about 70° to 80° C. since, at this temperature, the viscosity of the solution was somewhat lower and this aided the filtration procedure.



In practicing my process, I have found that a suitable time for the overall reaction is in the range of about 1 to about 5 hours, and preferably the reaction time employed is about 3 to 4 hours. The concentration of the alkali-metal hypochlorite in the reaction mixture can range from about 0.25 to about 2.0% by weight. Preferably, however, the concentration of the alkali-metal hypochlorite in the reaction mixture is controlled within the range of about 0.5 to about 1.0% by weight. Of the various enumerated alkali-metal hypochlorites, I prefer and find best the use of sodium hypochlorite. The reaction temperature may be varied; however, I have found that a temperature of about 20° C. to about 30° C. is quite suitable in the practice of my process.

Preferably, the Xanthomonas colloid which I purify according to my process is that produced by the bacterium *Xanthomonas campestris*. However, related species of Xanthomonas also produce hydrophilic colloids which may be utilized with almost equal success in many instances. Such other species are *Xanthomonas begoniae, Xanthomonas malvacearum, Xanthomonas carotae, Xanthomonas incanae, Xanthomonas phaseoli, Xanthomonas vesicatoria, Xanthomonas papavericola, Xanthomonas translucens, Xanthomonas vasculorum, Xanthomonas hederae,* and others. These are all included within the scope of my invention.

The final product is precipitated from the beer or other aqueous solution thereof by precipitation with alcohol. Suitable alcohols for such purpose are lower alcohols, such as methyl, ethyl or isopropyl alcohol. The alcohol should be used in an amount in excess of the water present in the beer or solution. The preferred alcohol is isopropyl alcohol and I have found a ratio of about 55 parts alcohol to 45 parts water on a weight basis to be effective. Higher amounts of alcohol will increase operation costs. In using methyl or ethyl alcohol, slightly higher amounts are required than when using isopropyl alcohol. The precipitate resulting from the aforementioned alcohol treatment is then preferably dried and milled.

As described in the foregoing specification, my invention provides a Xanthomonas hydrophilic colloid of greatly improved clarity by means of a process which does not require dilution of the colloid coupled with a filtration procedure. Having fully defined my invention in the specification, I desire to be limited only by the lawful scope of the appended claims.

I claim:

1. Process for purifying a Xanthomonas hydrophilic colloid, said process comprising contacting a Xanthomonas hydrophilic colloid containing proteinaceous impurities in an aqueous media with an alkali metal hypochlorite, maintaining the pH of said media above about 8.0 until said proteinaceous impurities are oxidized, adjusting the pH of said media to slightly acid, and precipitating said Xanthomonas hydrophilic colloid through addition of a lower alcohol to said media.

2. The process of claim 1 wherein the pH of said media is maintained above about 10.0 after addition of said alkali metal hypochlorite.

3. The process of claim 1 wherein said Xanthomonas hydrophilic colloid containing proteinaceous impurities is in the form of fermentation beer.

4. The process of claim 1 wherein said Xanthomonas hydrophilic colloid is produced by the bacterium *Xanthomonas campestris.*

5. The process of claim 1 wherein said Xanthomonas hydrophilic colloid is produced by the bacterium *Xanthomonas malvacearum.*

6. The process of claim 1 wherein the concentration of said alkali metal hypochlorite is about 0.25 to about 2.0% by weight of the reaction mixture.

7. The process of claim 2 wherein the pH of said